

Based on the paper "**Electron Geometry**".

A crude attempted visualization of a possible electron toroidal quantum orbit is plotted.

It is unlikely to be numerically viable.

**Done with Maple software:**

*restart : with(plots) :*

**local** beta, gamma :

*Digits := 24 : interface(displayprecision = 6) :*

$\beta e_1$  : and  $\gamma e_1$  : are temperature-reduced values in meters from the paper "**Electron Geometry**":

$\beta e_1 := 2.644842743E-11 :$

$\gamma e_1 := 2.644561075E-11 :$

$\alpha := .0072973526 :$

$\gamma$  is the major radius and  $\beta$  is the minor radius of a toroidal orbit, normallized here to  $\beta=1$  for plotting.

$\beta := 1.0 : \gamma := \frac{\gamma e_1}{\beta e_1} = 0.999894$  gamma scaled for beta equal to 1

$j := 4.0 :$  Index j sets 4 beta orbits for 1 electron orbit cycle.

$i := 2.0 \cdot \frac{\gamma e_1}{\gamma e_1 + \beta e_1} = 0.999947$  Index i scales gamma path from electron radii, 2 per orbit cycle

**Torus formula R:**

$R := (a, b) \rightarrow \langle (\gamma + \beta \cdot \cos(b)) \cos(a), (\gamma + \beta \cdot \cos(b)) \sin(a), \beta \cdot \sin(b) \rangle :$

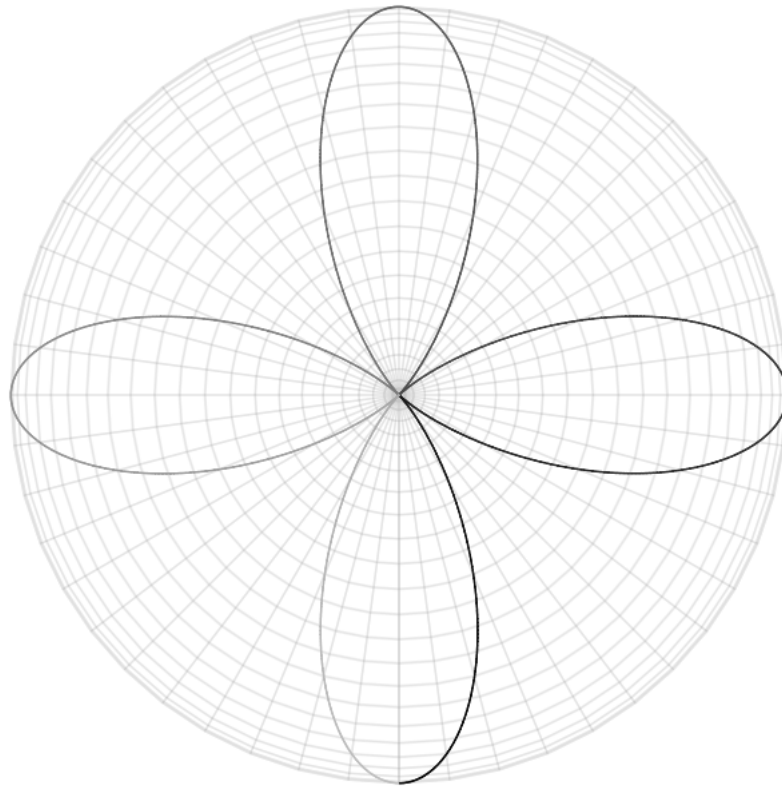
$k := 1.0 :$  Plot index k sets number of cycles of electron orbit to plot.

**Plot definition:**

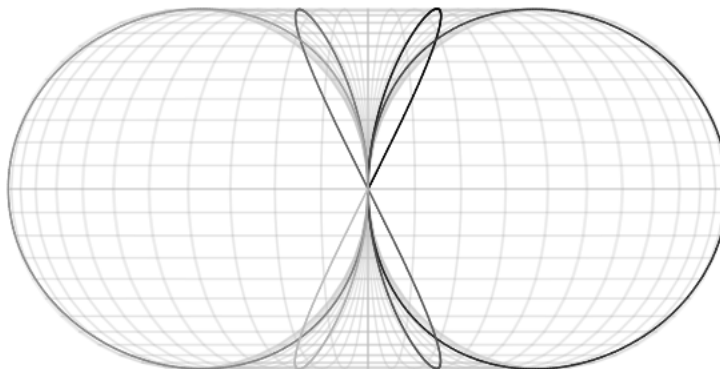
$plot3d(R(a, b), a = 0 .. 2 \pi, b = 0 .. 2.0 \pi, scaling = constrained, axes = none, colorscheme = ["gray", "gray"], style = wireframe, transparency = .40) : F := \% :$

$spacecurve(R(i \cdot a, j \cdot a), a = 0 .. k \cdot 2 \cdot \pi, colorscheme = ["black", "gray"], thickness = 0, numpoints = 5000, transparency = .00) : G := \% :$

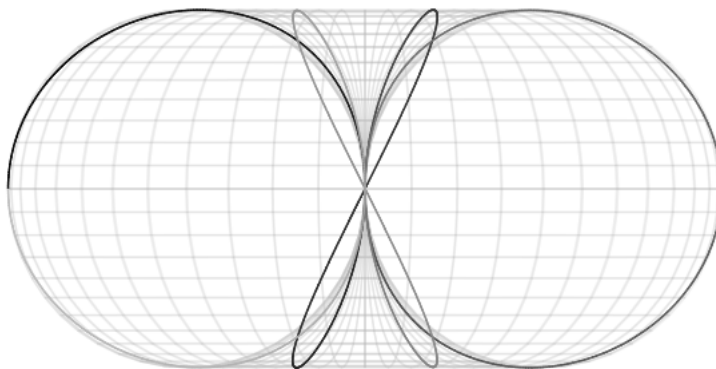
**"Top" view:**  $\text{display}((F, G), \text{orientation} = [0, 0, 0]);$



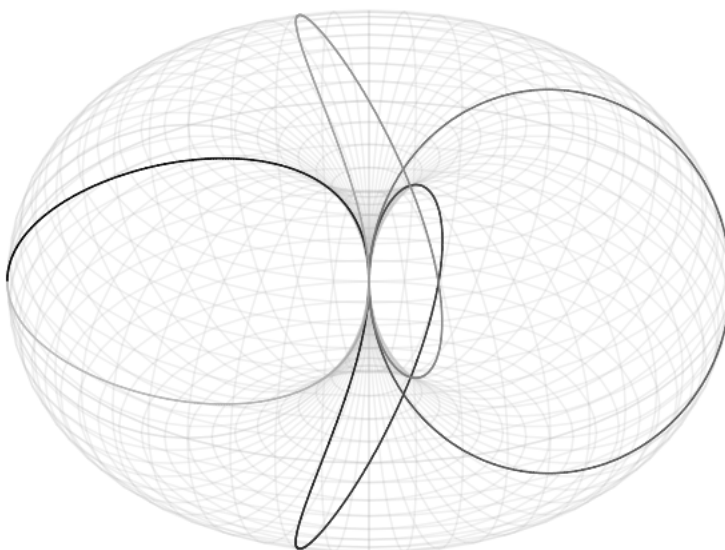
**"Side" view:**  $\text{display}((F, G), \text{orientation} = [0, 90, 0]);$



**"Side" view rotated 90 degrees:**  $\text{display}((F, G), \text{orientation} = [90, 90, 0])$



**Tilted "Side" view rotated 90 degrees:**  $\text{display}((F, G), \text{orientation} = [90, 60, 0])$



$$k := \frac{0.125}{\alpha^2} = 2347.358111 \quad \text{Plot index } k \text{ sets number of cycles for about half of a full quantum orbit.}$$

**"Top" view:**

```
plot3d(R(a, b), a = 0 .. 2 * pi, b = 0 .. 2 * pi, orientation = [0, 0, 0], scaling = constrained, axes = none,
  colorscheme = ["gray", "gray"], style = wireframe, transparency = .40) : F := %:
spacecurve(R( i * a, j * a), a = 0 .. k * 2 * pi, colorscheme = ["black", "gray"], thickness = 0, numpoints
  = 50000, transparency = .00) : G := %: display(F, G);
```

